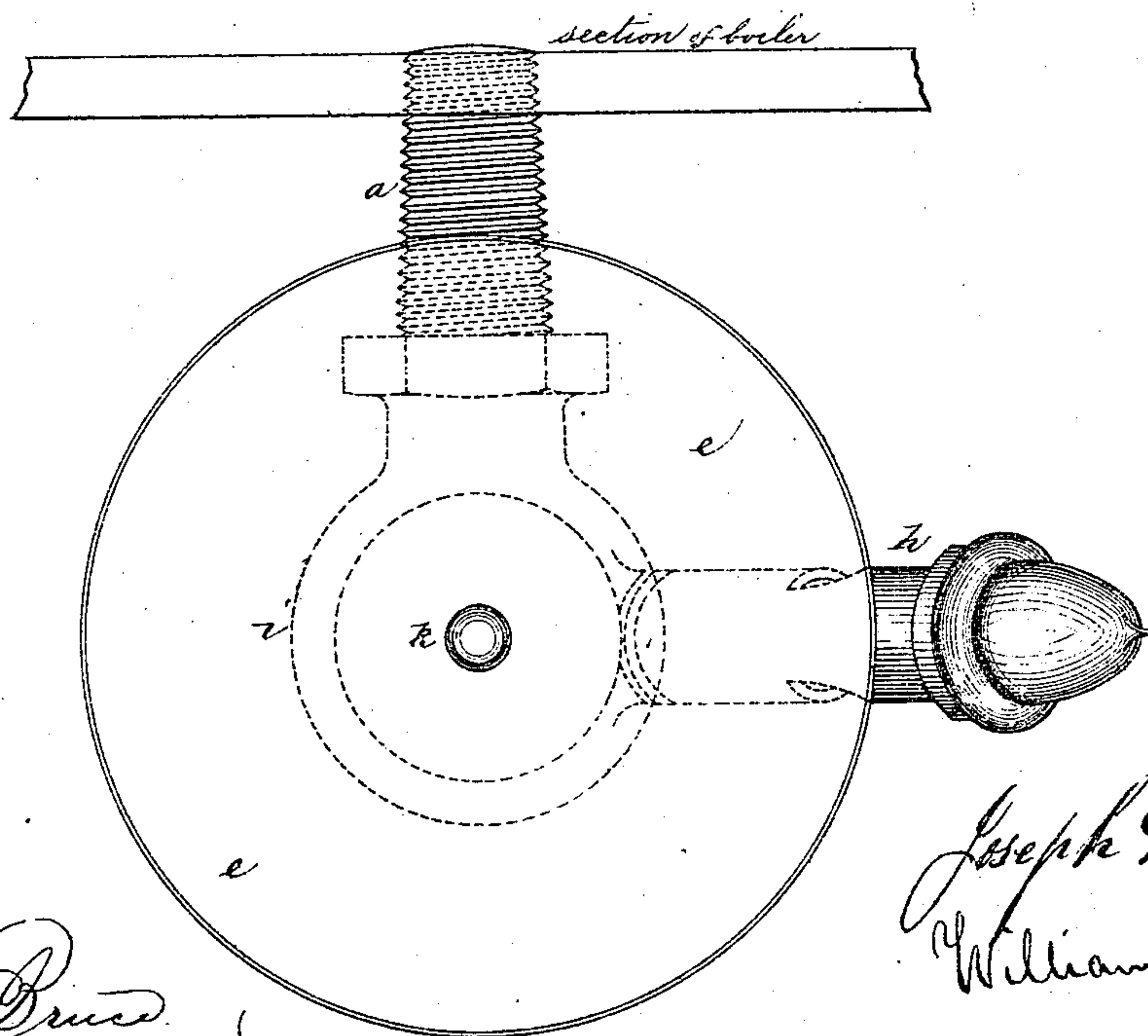
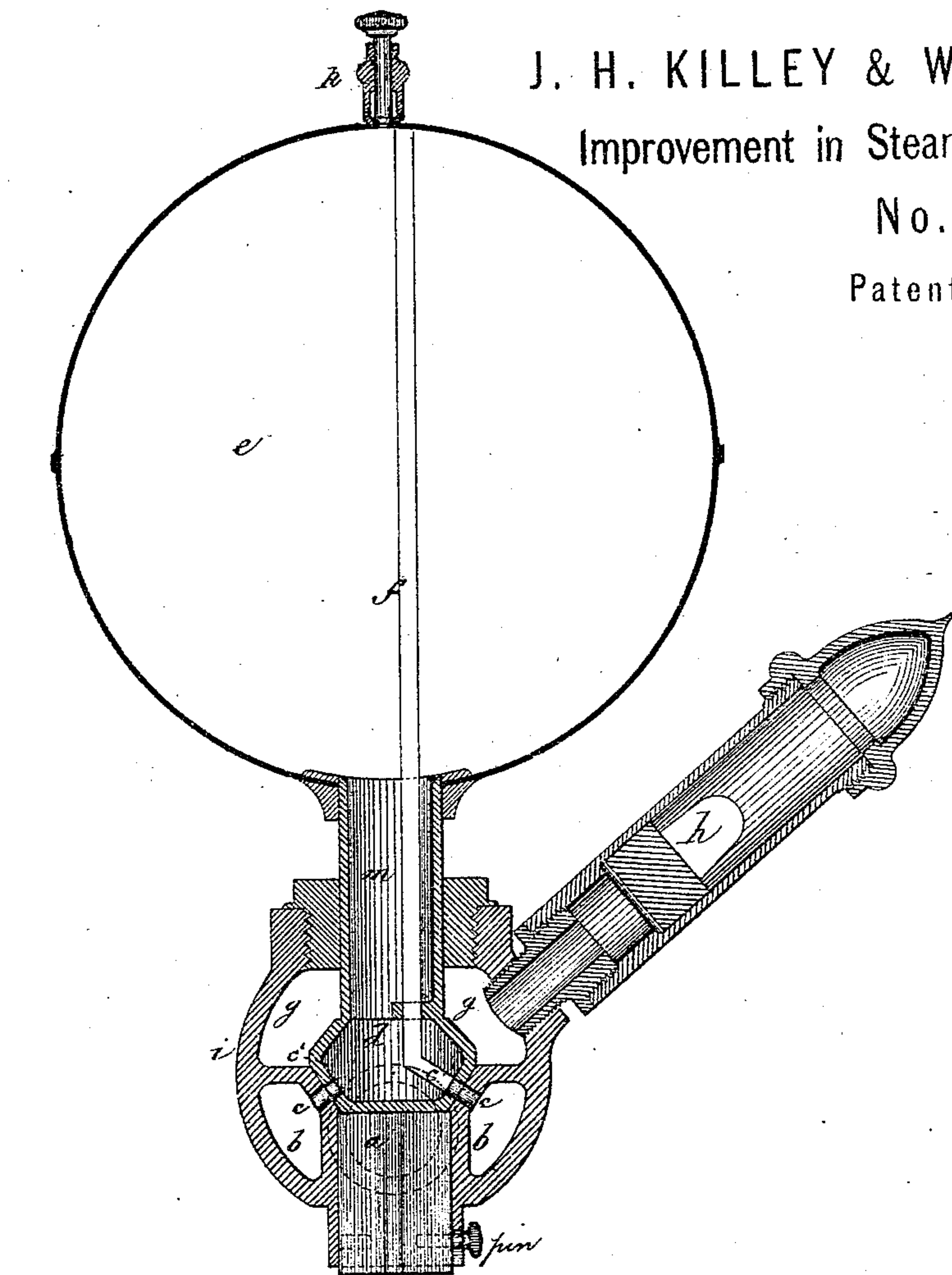


J. H. KILLEY & W. J. KILLEY.

Improvement in Steam Boiler Alarms.

No. 123,484.

Patented Feb. 6, 1872.



Inventors.

Joseph Henry Killey
William John Killey

W. Bruce
Walter Atherstone

Witnesses

UNITED STATES PATENT OFFICE.

JOSEPH HENRY KILLEY AND WILLIAM JOHN KILLEY, OF HAMILTON,
CANADA.

IMPROVEMENT IN STEAM-BOILER ALARMS.

Specification forming part of Letters Patent No. 123,484, dated February 6, 1872.

SPECIFICATION.

We, JOSEPH HENRY KILLEY, of the city of Hamilton, in the county of Wentworth, in the Province of Ontario, Canada, and WILLIAM JOHN KILLEY, of same place, have invented a certain new and useful apparatus or machine for Indicating Low Water, High Steam, and Foaming in Steam-Boilers, of which the following is a specification.

The object of the invention is to provide a more simple, convenient and effectual automatic device for indicating low water, high steam, and foaming in boilers, than anything hitherto used.

Figure 1 is a transverse section of the machine embodying our invention. Fig. 2 is a top view of the same.

It will be seen that the stem *a*, Fig. 1, attached to a valve-box and seat, *i*, is screwed into a steam-boiler, at or about the low-water line of such boiler; through this stem *a* the water or steam in the boiler is conducted to an annular space, *b*, surrounding the bottom of the valve-seat, through which seat two small holes, *c c*, are drilled. On this said seat a hollow conical valve, *d*, is placed, with corresponding holes *c¹ c²* drilled through it. Attached to the valve by the tube *m* is a globular or other-shaped vessel, *e*, of any desired size, containing a small vertical tube, *f*. Its lower part is connected with one of the holes *c*, and its upper end runs to within one-eighth of an inch from the top of the globe. An annular chamber, *g*, surrounds the upper part of the valve, and communicates with the inside of the valve and globe when the valve is raised by means of the hole *c¹*. On one side of the valve-box *i* above the valve-seat, and connected with the chamber *g*, is placed a whistle, *h*, as shown, acted on by the escaping steam, as the apparatus is brought into action by the varying conditions surrounding it as follows: When a steam-boiler has the water at the ordinary working-point, the aforesaid holes *c c* being covered with water, the pressure of the steam on the surface of the water in the boiler fills the globe *e*, or other vessel with water. It is consequently pushed down on its seat with a pressure equal to the weight of the water in the globe and the material of which it is composed—the holes in the valve-seat being so proportioned that no water can escape with the ordinary working-pressure of the steam—but, on the pressure being unduly increased,

the valve will be lifted from its seat, a small quantity of water will escape into the annular space *g* surrounding the upper side of seat, being heated to the temperature due to the pressure will partly flash into steam and sound the whistle *h*, thus acting as a check on the safety-valve and steam-gauge. On the water in a boiler foaming, the difference in the gravity of the water in the boiler and that in the globe or vessel *e* causes it to discharge a part of its contents until an equilibrium is established between it and the boiler. The pressure on the valve-seat will be then reduced below the pressure of the steam and water, and the valve will rise and whistle as before. On the water in a boiler getting below the entrance into the apparatus, or approaching a danger-level, the steam passes through the valve-seat tube *f* by means of the corresponding passages into the top of the globe or vessel *e*; the water then by gravitation passes out of the globe, diminishing the pressure on the valve-seat and liberating the steam, which escapes at first gently through the whistle, but continually increases in violence as its weight diminishes, and sounds the whistle violently. On the water being re-admitted into the boiler the hollow globe *e* fills automatically, and gradually settles down into its seat until again relieved of its water by the same means. The apparatus can also be used as an ordinary gauge-tap when required, which also insures its continual action as a low-water detector. Its action, on the water being lowered, is insured by the diminished pressure on the seat caused by the discharge of the water, and by the increased pressure of the steam consequent on the lowering of the water in the boiler.

What we claim as our invention is—

A combined water-gauge cock, high-steam, low-water, and foaming-indicator, which consists in the combination of globe *e* with stem *a*, whistle *h*, valve-box *i*, containing chambers *b g*, passages *c c*, hollow conical valve *d* with passages *c¹ c²*, and tube *f*, all arranged as shown, and for the purposes set forth.

Dated at Hamilton, Canada, this 18th day of August, A. D. 1871.

JOSEPH HENRY KILLEY.
WILLIAM JOHN KILLEY.

Signed in the presence of—
W. BRUCE,
WALTER ATHERTON.